FORM PTO-1390
(REV 12-29-99)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER
1434-1

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)
09/600343

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/SE99/00047	15 January 1999	16 January 1998

TITLE OF INVENTION
Method For Injecting of Foamed Concrete and a Foamed Concrete

APPLICANT(S) FOR DO/EO/US
Johansson et al

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. [x] This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. [ ] This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. [x] This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. [ ] A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. [x] A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. [x] is transmitted herewith (required only if not transmitted by the International Bureau).
   b. [ ] has been transmitted by the International Bureau.
   c. [ ] is not required, as the application was filed in the United States Receiving Office (RO/US).
6. [ ] A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. [ ] Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. [ ] are transmitted herewith (required only if not transmitted by the International Bureau).
   b. [ ] have been transmitted by the International Bureau.
   c. [ ] have not been made; however, the time limit for making such amendments has NOT expired.
   d. [ ] have not been made and will not be made.
8. [ ] A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. [x] An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. [ ] A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern document(s) or information included:

11. [ ] An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. [ ] An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. [x] A FIRST preliminary amendment.
    [ ] A SECOND or SUBSEQUENT preliminary amendment.
14. [ ] A substitute specification.
15. [ ] A change of power of attorney and/or address letter.
16. [x] Other items or information:

A) A copy of PCT International Search Report
B) Certificate of Express Mail
C) International Preliminary Search Report
D) PCT/IB/308
E) PCT/IB/304

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
09/600343		

17. ☒ The following fees are submitted:	CALCULATIONS PTO USE ONLY	
BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :		
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO **$970.00**		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO **$840.00**		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO **$690.00**		
International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) ..... $970 ~~$970.00~~		
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) **$96.00**		
ENTER APPROPRIATE BASIC FEE AMOUNT =	$ 970.00	
Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$ 130.00	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	11 - 20 =		X **$18.00**	$ 0	
Independent claims	2 - 3 =		X **$78.00**	$ 0	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ **$260.00**	$	

TOTAL OF ABOVE CALCULATIONS =	$ 1100.00	
Reduction of 1/2 for filing by small entity, if applicable. A Small Entity Statement must also by filed (Note 37 CFR 1.9, 1.27, 1.28).	$	
SUBTOTAL =	$ 1100.00	
Processing fee of **$130.00** for furnishing the English translation later than ☐20 ☐30 months from the earliest claimed priority date (37 CFR 1.492(f)). +	$	
TOTAL NATIONAL FEE =	$ 1100.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property +	$	
TOTAL FEES ENCLOSED =	$ 1100.00	
	Amount to be refunded:	$
	charged:	$

a. ☒ A check in the amount of $ 1100.00 to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. _____ in the amount of $_____ to cover the above fees. A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 12-1217. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

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SIGNATURE:

John Lezdey

NAME

22,735

REGISTRATION NUMBER

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re: Application of JOHANSSON et al:

Serial No.:

Filed: July 14, 2000

International Application: PCT/SE99/00047

International Filing Date: 15 January 1999

Priority Date: 16 January 1998

Box PCT - New Application
Hon. Commissioner for Patents
Washington, DC 20231

PRELIMINARY AMENDMENT

Dear Sir:

In connection with the above-identified application, kindly enter the following amendments:

In the Specification

On page 1, before line 3, insert - - Field of the Invention - -

before line 11, insert - - Background of the Invention - -

before line 27, insert - - Summary of the Invention - -

Page 2, before line 28, insert - - Brief Description of the Drawing - -

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before line 32, insert - - Description of the Preferred Embodiments - -

In the Abstract

Kindly replace the abstract with the new abstract page which is herewith submitted.

In the Claims

Kindly amend the claims as follows:

1. (Amended) A method of stabilizing gravel, sand crushed stone, rock and concrete structures which are cracked, porous or have other cavities difficult of access and sealing the same against flows of water by injecting a pumpable, low-viscous concrete, which is based on an aqueous dispersion containing cement. [characterized by] which comprises the steps of injecting aerated concrete with a pore volume of at least 20% by volume into the cavities that are difficult of access and are to be sealed, [the] said aerated concrete being first injected at [such] a low pressure whereby [that] the aerated concrete remains intact, and the aerated concrete being then exerted to an increased pressure, [such that] whereby the aerated concrete located in or in the vicinity of the cavities are pressed further into the cavities.

2. (Amended) [A] The method according to claim 1, wherein the aqueous dispersion [comprising] comprises finely-ground cement, a dispersing agent and optionally fine-particulate material having a large specific surface,[characterized in]and that in the aerated concrete, existing air bubbles collapse when the aerated concrete is pressed further into the cavities, escaping air entraining cement and the find particulate material, if any, into the cavities, where sedimentation and hydration take place.

3. (Amended) [A] The method according to claim 1 [or 2, characterized in that] wherein the aerated concrete has an air pore volume of 40-85%, is hydrophobic and is not spontaneously miscible with water.

4. (Amended) [A] The method according to [any one of the preceding claims, characterized in that] claim 1 wherein the aerated concrete contains an anionic surfactant of the general formula

$$(R)_m\text{-}R_1\text{-}(SO_3M)_2 \qquad (1)$$

wherein R is an aliphatic group having 4-20 carbon atoms in the group or in the groups R being 6-30, R_1 is an aromatic group containing at least 2

aromatic rings and 10-20 carbon atoms, and M is a preferably monovalent cation or hydrogen.

5. (Amended) [A] The method according to claim 1 wherein [any one of the preceding claims, characterized in that] the aerated concrete contains an accelerator, retarder [and/or] or thickening agent.

6. (Amended) [A] The method according to [any one of the preceeding claims, characterized in that] claim 1 wherein the injection of the concrete occurs at a pressure below 3 bar, and that the pressure is then increased to at least 6 bar.

7. (Amended) Aerated concrete [characterized in that is has] having a pore volume of at least 20% and contains finely-ground cement with [such] a particle distribution [that] whereby at lease 95% pass a screen with a mesh size of 64 µm, and 2-10% based on the weight of the cement, of a fine-particulate material with a particle size smaller than that of the cement.

8. (Amended) [Aerated] The aerated cement concrete according to claim 7, [characterized in that it has] comprising an air pore volume of at least 40-85% and contains

0.1-1 parts by weight of a dispersing agent,

35-80 [preferably] 50-70 parts by weight of water,

0-10 parts by weight of a fine-particulate material with a particle size smaller than that of the cement,

0-2.5 parts by weight of a resin having a molecular weight below 10,000 and a

0-2.5 parts by weight of an accelerator, retarder and/or thickening agent which control the hydration of the cement or gradually increase the viscosity of the concrete, and

0-2 parts by weight of a swelling additive per 100 parts by weight of cement.

9. (Amended) [Aerated] <u>The aerated</u> concrete according to claim 8, [characterized in that] <u>wherein</u> the dispersing agent contains a disulphonate of the general formula

$$(R)_m\text{-}R_1\text{-}(SO_3M)_2 \qquad (I)$$

wherein R is an aliphatic group having 4-20 carbon atoms, m is a number 1 or 2, the sum of the number of carbon atoms in the group or in the groups R being 6-30 R_1 is an aromatic group containing at least 2 aromatic rings and 10-20

carbon atoms, and M is a [preferably] monovalent cation or hydrogen.

10. (Amended) [Aerated] The aerated concrete according to claim 8 which comprises [any one of the claims 7-9, characterized in that it contains] 0.1-2.5 parts by weight of the resin [in claim 8].

11. [Aerated] The aerated concrete according to claim 8 comprising [any one of the claims 7-10 characterized in that it contains] 2-10% by weight of [the] fine-particulate material [in claim 8] and [that the] said cement [has such] having a particle size [that] whereby 95% by weight pass a screen with a mesh size of 32µm.

Remarks

The specification and claims have been amended so as to obviate any 35USC112 objections. The multiple dependencies have been deleted so as to avoid additional costs.

No new matter has been added.

Action on the merits is now requested.

Respectfully submitted,

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1434-1

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534 Rec'd PCT/PT 14 JUL 2000

Method for injecting of foamed concrete and a foamed concrete

This invention relates to a method of stabilising gravel, sand, crushed stone, rock and concrete structures which are cracked, porous or have other cavities difficult of access, and sealing the same against flows of water by injecting a pumpable, low-viscous aerated concrete which is based on an aqueous dispersion containing finely-ground cement, a dispersing agent and optionally fine-particulate material having a large specific surface.

When stabilising and sealing gravel, sand, rock and concrete structures, which are porous or cracked, or have other cavities difficult of access, it is generally known to inject pumpable, easy-flow concrete containing cement and frequently various additives, such as accelerators and retarders controlling the curing of the cement, and fine-particulate material promoting the sealing of the cavities. However, it has been found that in many cases it is difficult to achieve a satisfactory result. For instance, it has proved to be difficult to make the injected concrete reach sufficiently far into the narrow cavities to obtain a satisfactory seal against penetrating water. It has also been found to be difficult, in e.g. rock which conducts great amounts of water, to apply the concrete and make it cure before an increase of the water-cement ratio occurs and the concrete is wholly or partly flushed away.

According to the present invention, it has now been found possible to solve these problems and present an effective method of stabilising and sealing gravel, sand, crushed stone, rock and concrete structures. The method is characterised by injecting aerated concrete with a pore volume of at least 20% by volume into the cavities that are difficult of access and are to be sealed. The injection should be carried out by first injecting the aerated concrete at such a low pressure that the aerated concrete remains intact, and then applying an increased pressure,

such that the air bubbles located in or in the vicinity of the cavity are pressed further into the cavities and collapse, whereby air entrains cement and a fine-particulate material, if any, into the cavities, where sedimentation and hydration take place. The pressure when injecting the aerated concrete is suitably below 3 bar while the increased pressure usually is above 6 bar.

By applying the inventive method, it has been found possible to considerably reinforce the stabilisation by the fact that the hydratable concrete mixture can penetrate further into the cracks than is possible when injecting a conventional concrete mixture. The cement is suitably finely ground to such a particle size that at least 95% pass a screen having a mesh size of 64 μm, preferably 34 μm and most preferred 16 μm if penetration into fine cavities is desired. The air bubbles and the escape thereof through the cavities also prevent penetration of water during injection and thus prevent, at least partly, the fresh concrete from being diluted with water and make any flushing away difficult. If the flowing through of water is extremely great or if a low water permeability is desired, it has according to the invention been found to be suitable to use hydrophobic aerated concrete. Preferably the aerated concrete is hydrophobised to such an extent that it does not spontaneously mix with water. As a result, dilution of the mixture with water is avoided while at the same time the risk of flushing away is considerably reduced.

The invention will now be described in more detail with reference to the drawing, in which Fig. 1 illustrates the penetration of the fresh concrete into a crack, and Fig. 2 is an enlarged picture of the encircled portion in Fig. 1.

The present invention also refers to low-viscous, pumpable aerated concrete, which is based on cement with such a particle size that 95% by weight pass a screen having a mesh size of 64 μm and a pore volume of at least 20% by volume. The aerated concrete suitably contains the following

components:

100	parts by weight of cement, ground to such a particle size that 95% by weight pass a screen of the mesh size 64 μm, preferably 32 μm,
0.1-1	parts by weight of a dispersing agent, such as a protein, an anionic surfactant and/or a polymer, and
35-80	preferably 50-70 parts by weight of water,
0-10	parts by weight of a fine-particulate material with a particle size smaller than that of the cement,
0-2.5	parts by weight of a resin having a molecular weight below 10,000 and a saponification rate of 100-250, and
0-2.5	parts by weight of an accelerator, retarder and/ or thickening agent which control the hydration of the cement or gradually increase the viscosity of the concrete, and
0-2	parts by weight of a swelling additive.

The pore volume of the aerated concrete is suitably between 40% and 85% and preferably between 50% and 80%. In connection with very narrow cavities, such as microcracks in rock, the concrete suitably contains 1-10 parts by weight of a fine-particulate material per 100 parts by weight of cement. If hydrophobic aerated concrete is desired, the hydrophobicity can be increased by adding resin in an amount of 0.1-2.5 parts by weight per 100 parts by weight of cement and, optionally, fine-particulate bentonite in an amount of 0.1-3 parts by weight per 100 parts by weight of cement. The concrete usually has a density of 300-1800 kg/m^2, preferably 400-1500 kg/m^2.

Cement is a hydraulic binding agent which, with water, forms a paste and cures by hydration. The curing depends in the first place on the formation of calcium silicate hydrate. The most important silicate-cement-containing composition is Portland cement clinker. When applying the invention use is preferably made of Portland

cement owing to its excellent all-round properties. It contains, among other things, tricalcium silicate, dicalcium silicate, tricalcium aluminate and calcium aluminium ferrite. Other examples of suitable types of cement are Portland slag cement, Portland fly ash cement, Portland pozzolana cement, coloured Portland cement, white Portland cement, low heat Portland cement and rapid hardening Portland cement, which are all based on Portland cement clinker. When using cement in injected concrete, it is convenient to grind cement additionally to such a particle size that at least 95% by weight pass a screen having a mesh size of 32 μm, preferably 16 μm for the concrete to penetrate more easily into narrow cavities. If required owing to the circumstances, a still finer cement can be used.

The dispersing agents are added as air-pore-forming and stabilising additives. Examples of such additives are proteins, nonionic alkylene oxide adducts, xylene sulphonate, alkyl sulphate, alkyl ether sulphate, olefin sulphate and polymer sulphonic-acid-group-containing compounds, such as lignosulphonate, naphthalenesulphonate formaldehyde condensate and melamine sulphonate formaldehyde condensate and mixtures thereof. The proteins, the nonionic alkylene oxide adducts and the short-chain anionic compounds affect in the first place the formation of air pores while the polymer anionic polyelectrolytes primarily contribute to improve stability and pumpability.

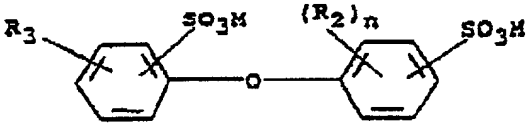
Specially preferred dispersing agents are anionic surface-active disulphonates of the type described in patent application WO 97/39992, where the disulphonates are of the general formula

$$(R)_m-R_1-(SO_3M)_2 \qquad (I)$$

wherein R is an aliphatic group having 4-20 carbon atoms, m is a number 1 or 2, the sum of the number of carbon atoms in the group or in the groups R being 6-30, R_1 is an aromatic group containing at least 2 aromatic rings and 10-20 carbon atoms, and M is a preferably monovalent cation or hydrogen.

The group R_1 usually contains only carbon and hydrogen, but also oxygen atoms may be included, for instance in the form of ketone groups. Besides having an air-entraining capacity, these compounds yield a hydrophobic aerated concrete which has low viscosity and is easily pumpable.

The disulphonates of formula I suitably consist of compounds where R is an aliphatic group having 6-14 carbon atoms and R_1 is an aromatic group having 10-17 carbon atoms and two aromatic rings. Examples of such disulphonates are those having the following formulae



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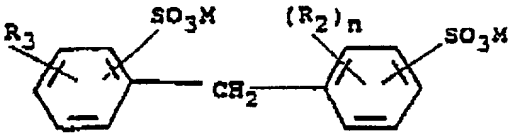

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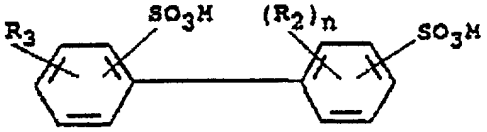

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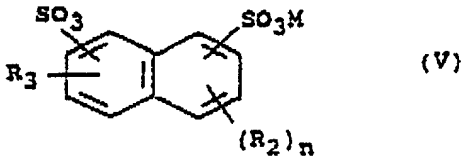

(V)

wherein R_3 is an aliphatic group having 4-20 carbon atoms, M has the above meaning, R_2 is an aliphatic group having 1-14 carbon atoms and n is 0 or 1, preferably 0. The groups R_3 and R_2 are, for instance, a butyl group, a hexyl group, an octyl group, a decyl group or a dodecyl group, which can be straight or branched. The group R_2 can also suitably be a lower alkyl group, such as a methyl or ethyl group. The sum of the number of carbon atoms in the groups R_3 and R_2 is preferably 8-24. These disulphonates result in a stable,

low-viscous aerated concrete which can easily be pumped. Particularly preferred are alkyl-substituted diphenyl ethers.

The fine-particulate material is e.g. fly ash, bentonite (myanite), rock dust, finely-ground lime, gypsum and silica having a particle size which is smaller than that of the cement. It should suitably have a particle size which to at least 95% is below 5 μm and a specific surface in the order of at least 1,500 m^2/kg or higher. Silica having a particle size of 0.1 μm and a specific surface of $2 \cdot 10^4$ is an example of a fine-particulate material having a good penetration capacity. Fly ash, lime and silica also affect the setting of the concrete.

The resins, which can be synthetic or natural, or derivatives thereof are primarily added to increase the strength, water-repelling properties (hydrophobicity) and homogeneity of the concrete. The resins and their derivatives may contain one or more aromatic and/or aliphatic groups having at least 12, preferably 16-35 carbon atoms. The groups can be saturated as well as unsaturated. Preferred resins are those having an acid number from 4 to 170 and a saponification rate from 150 to 175. Examples of suitable resins are different colopholic acids and mixtures thereof, such as colophonium, and their dimerised derivatives as well as wholly or partly saponified, esterified and/or hydrated derivatives thereof. Examples of suitable hydroxyl compounds for esterification are methanol, glycol, glycerol and pentaerythritol. Other examples are modified colophonium resins modified with unsaturated fatty acids, such as maleic acid and their preferably partially esterified derivatives as well as phenol-modified colophonium. Examples of suitable phenols are 4-tert-butyl phenol, nonyl phenol and 4,4'-diphenylolpropane (bisphenol A).

Other examples of additives are retarders or accelerators, which control the hydration of the cement,

thereby adjusting it to the conditions prevailing in injection and making it occur at the desired point of time. Examples of accelerators are alkali salts, such as calcium chloride, sodium hydroxide, potassium carbamide and sodium aluminate, while examples of retarders are saccharides, phosphates, citric acid and lignosulphonate. The latter also has a pronounced dispersing effect. Also the addition of a thickening agent, which gradually develops its viscosity, may serve to prevent the aerated concrete from being flushed away by penetrating water before it has cured. Examples of such thickening agents are saccharide compounds, such as nonionic cellulose ethers, polyurethanes and polyacrylates. Examples of suitable cellulose ethers are hydroxyethylcellulose, methylcellulose, methylhydroxyethylcellulose and ethylhydroxyethylcellulose.

Swelling additives are admixed to counteract volume reduction and thus prevent cracks and cavities from being incompletely filled. An example of swelling additives is aluminium powder.

When injecting aerated concrete it is most important for it to be stable. Should the mixture not be stable, the individual cement particles will settle owing to their dead weight and thus block and prevent further injection into, for instance, a system of cracks in a rock. The fine-particulate material having a large specific surface, such as silica, gypsum and myanite, increases the stability of the aerated concrete and can thus be carried by the aerated concrete up to the cracks in the rock. Using aerated concrete having a high content of moisture gives a low-viscous concrete with low shear strength. This fact and also the fact that the air bubbles carry the particles on their surfaces contribute to low viscosity of the fresh concrete and imply that the concrete can be injected at a low pump pressure but still obtain good penetration. The low pump pressure that is necessary for injecting the aerated concrete also gives the advantage of lower demands on the

anchoring of adapters in bore holes. Moreover, the safety for staff handling the equipment can be increased, and the risks of tubes breaking and adapters releasing their hold can practically be eliminated.

Fig. 1 shows the penetrating of the concrete 1 having a high moisture content into a crack 2 in a rock or the like. The arrow 3 indicates the direction of flow of the concrete, the air bubbles in the concrete being designated 4.

As mentioned above, the concrete 1 is pumped preferably through a tube and/or bore hole up to the crack 2 of the rock, the pump pressure being kept at a low level. As also mentioned above, the air bubbles 4 carry cement and other particles of material in an effective way up to and into the crack. Then the pressure in the tube is increased considerably, which means that the air bubbles in the crack collapse and an air flow transport of particles and water into the interior of the crack arises. This means that the cement particles agglomerate well into the crack and cure to a high density concrete, thereby sealing the crack.

According to the invention, the aqueous concrete mixture can be made by mixing water, including a dispersing agent and other organic additives which are soluble or dispersible in water, with dry mortar containing, among other things, cement and optionally a fine-particulate material, to a homogeneous slurry.

Another technique is to combine, during stirring, a main mixture containing the greater part of cement, the greater part of water and fine-particulate material, and a supplementary mixture containing the remaining water, the remaining cement, the dispersing agent and optionally resin and other organic additives. The weight ratio of main mixture to supplementary mixture is usually in the range 20:1 to 2:1.

A further technique of manufacturing the aerated concrete is to supply to a discontinuous or continuous mixer

water, the dispersing agent and optionally resin and other organic additives as well as a small amount of cement, usually 2-40, preferably 5-30% by weight of the total amount of cement (suitably in the stated order). The resulting composition is stirred while increasing in volume to a homogeneous, stable air-containing concrete mixture, whereupon the remaining cement and the fine-particulate material are added in one or more steps or continuously and are mixed while being stirred.

The present invention is further illustrated by the following Examples.

Example 1

A house with a concrete base built on a foundation of sand and stone and subjected to proceeding settlement, was stabilised with aerated concrete according to the invention. The aerated concrete, which had a density of 495 kg/m^3 and an air pore volume of 69%, was based on Portland cement with such a particle size as to allow above 95% by weight to pass a screen with a mesh size of 32 µm and also contained per 100 parts by weight of cement 0.7 parts by weight of decyl-substituted diphenylether disulphonate of formula II and 0.35 parts by weight of Aquatac 6085, a glycerol resin acid ester with an active content of 59% by weight supplied by Bergvik Kemi AB.

The injection tubes were buried at a depth of 100 cm, and the aerated concrete was injected at a pressure of 1 bar, and when it was no longer possible to inject aerated concrete at this pressure, the pressure was increased to 10 bar, whereupon curing took place.

After injection, the settlement ceased and the injected aerated concrete was inspected by digging up the material round the injection tubes. The aerated concrete between stone and gravel had the expected air pore volume, whereas the aerated concrete that had been pressed into narrow spaces and cracks had no air pore volume or a very low such volume.

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09/600343

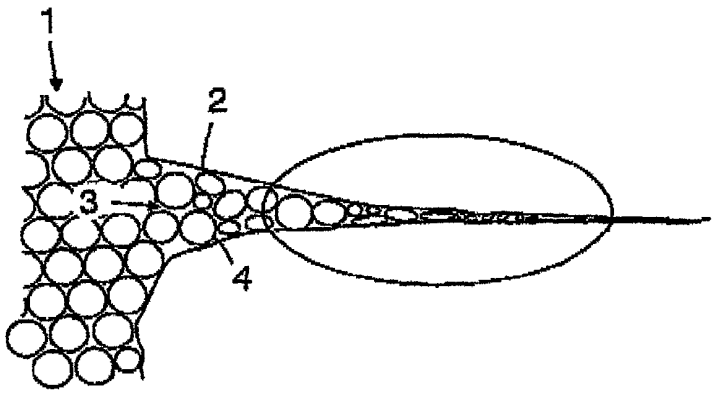

FIG.1

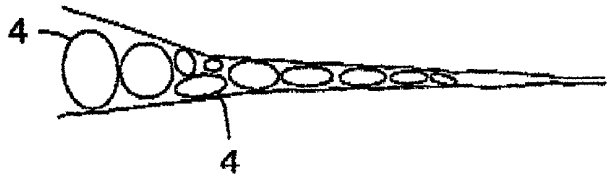

FIG.2

COMBINED DECLARATION AND POWER
OF ATTORNEY FOR PATENT APPLICATION

Docket No.: 1434-1

As a below named inventors, we hereby declare that:

Our residence, post office address and citizenship are as stated below next to our names.

We believe we are the original, first and sole inventors (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled METHOD FOR INJECTING IF FOAMED CONCRETE AND A FORMED CONCRETE the specification of which

____ is attached hereto.

x was filed on 15 January 1999 as Application Serial No. PCT/SE99/00047.

We hereby state that we have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

WE acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulation 1.56(a).

We hereby claim foreign priority benefits under Title 35, United States Code 119 of any foreign application(s) for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)			Priority Claimed	
PCT/SE99/0 0047	SWEDEN	15 01 99	Yes	No
(Number)	(Country)	(Day/Month/Year)		
9800082-1	SWEDEN	16 01 98	Yes	No
(Number)	(Country)	(Day/Month/Year)		
			Yes	No
(Number)	(Country)	(Day/Month/Year)		

We hereby claim the benefit under Title 35, United States Code, 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, 112, we acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

Serial No.	Filing Date	Status
Serial No.	Filing Date	Status
Serial No.	Filing Date	Status

I hereby appoint the following attorneys and request that you direct and transact all business in the Patent and Trademark Office connected with the above-identified application to them:

John Lezdey, Registration No. 22,735

Address all telephone calls to: John Lezdey
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Suite A
Clearwater, FL 33755

We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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